Transport Refrigeration Unit ATCM Tutorial

Revised 2-20-08

California Environmental Protection Agency
Air Resources Board

1

- These tutorial slides cover the California Air Resources Board's (ARB) Transport Refrigeration Unit (TRU) Airborne Toxic control Measure (ATCM).
- This regulation is required by California state law. Subsequent slides explain the need for this regulation.
- If you have questions, please see the last slide, where you will find ARB websites where more detailed compliance assistance materials and ARB staff contacts are listed.
- TRU stands for transport refrigeration unit. For the purposes of this regulation, a TRU is a refrigeration system that is powered by a diesel engine that is used in the transport of perishable goods. Refrigeration systems with compressors that are powered off a vehicle's engine with belts are not considered to be TRUs. Also, since electrically driven refrigeration systems on ocean-going shipping containers do not have an integral diesel engine, these are not TRUs.
- However, the TRU generator sets that provide electric power to these shipping containers are affected by this regulation.
- Unless otherwise noted, all references to TRUs also include TRU generator sets.

Overview

- Background
- TRU ATCM Overview
- Facility Reports
- Operator Requirements
- Verified Diesel Emission Control Strategies (VDECS)
- Enforcement
- Further Information/Contacts

2

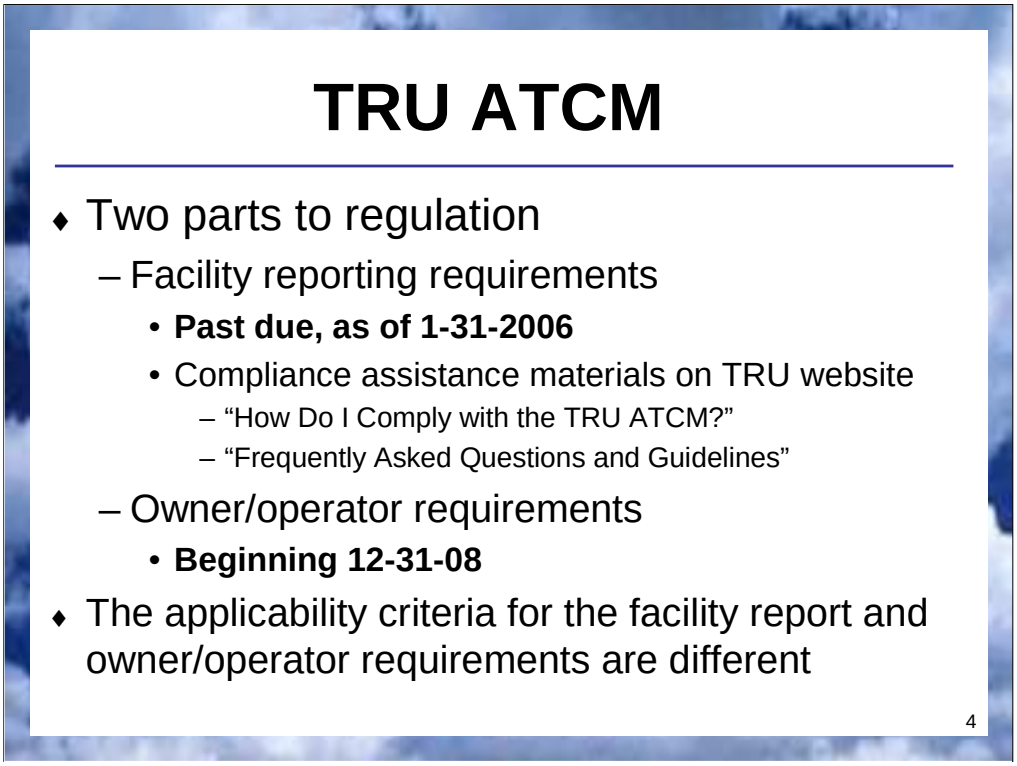
- Here's an list of what is covered by these slides.
- First, some background or history related to this regulation is provided.
- Then, an overview of the TRU ATCM, including the two parts of the regulation – facility reports and operator requirements – is discussed.
- Some information about verified diesel emission control devices, or VDECS, is included.
- Several slides discuss what affected parties can expect in the enforcement of this regulation.
- The last slide covers where you can find further information and who to contact if you have questions.

Background

- Diesel PM identified as a toxic air contaminant in 1998
- Diesel Risk Reduction Plan approved 2000
- TRU ATCM adopted February 2004
- Effective December 2004
- Requested U.S. EPA waiver, March 2005
- EPA waiver hearing, January 2006
- Two technology review workshops in 2007
- Outreach to fleets - ongoing

3

- State law requires ARB to assess the need for, and the appropriate degree of control to reduce the public's exposure to TACs.
- In 1998, diesel particulate matter (or PM) was identified as a toxic air contaminant, or TAC. If you are interested in the process that was used in making this dertermination and the science behind the public health risk due to diesel PM, a website you can visit is: http://www.arb.ca.gov/toxics/dieseltac/dieseltac.htm.
- Because of its potency and the large amount of diesel emissions in California's air, diesel PM is the number one contributor to adverse health effects of any TACs known today.
- The ARB adopted the Diesel Risk Reduction Plan in 2000, which included an element to develop a regulation to reduce diesel PM from TRUs.
- .The TRU ATCM was adopted by the Board in February 2004, and approved by the Office of Administrative Law in December 2004.
- ARB submitted a waiver application to the U.S. Environmental Protection Agency (EPA) in March of 2005. EPA has not taken action on this waiver application, but they have indicated they will make a decision by the end of the year. Nonetheless, ARB is obligated under state law to implement and enforce this regulation.
- Two technology review workshops were conducted in 2007.
- ARB has conducted a lot of outreach and these efforts continue. Numerous articles have been published in trucking and reefer trade magazines. We've talked to all of the trade associations with any remote connection to TRUs. Major mail-out campaigns to fleets in California (late 2007) and the rest of the U.S. (early 2008) were completed.
- And, we have a toll-free TRU Help Line, with staff standing by (see last slide).



- The next few slides provide an overview of the TRU ATCM.
- There are 2 parts to this regulation:

  – The facility reporting requirements: These reports were due 1-31-06, so they're past due now. ARB enforcement staff have been actively enforcing all of the diesel-related regulations, including refrigerated facilities that are late in reporting. These slides do not go into much depth on the facility reporting requirements since they are past due. There are compliance assistance materials on the TRU website that cover this is detail. Please see:

  "How Do I Comply with the TRU ATCM"

  "Frequently Asked Questions and Guidelines for Compliance"

  – The operator requirements are coming up and will be phased in, beginning in 2008. Those requirements are the focus of these slides.

- The applicability criteria for the facility report are unrelated to the applicability criteria for the operator requirements. Just because a TRU operator didn't have to submit facility reports does not mean they don't have to comply with operator requirements. There are different applicability criteria for these two parts and for the elements within the owner/operator requirements. Please pay very close attention to this.

Facility Reports

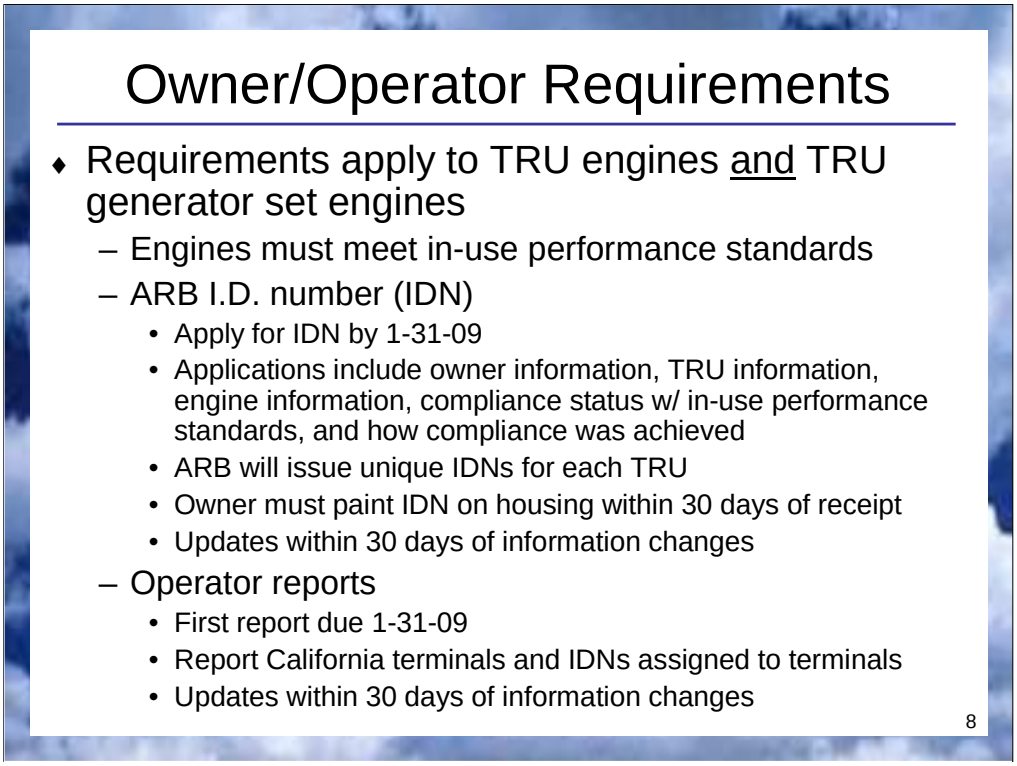
- Applies to “large” distribution centers in California where TRUs operate
  - “Large” is 20 or more loading spaces serving cold storage areas (refrigerated and frozen)
- One time facility report was due January 31, 2006
- Required reporting of
  - Facility informaiton
  - TRU activities and inventory
- **Fines for late reporting**

- The Facility Reports requirements only applied to “large” facilities. A “large” facility is defined as 20 or more loading dock spaces serving cold storage areas. This count includes both refrigerated and frozen storage areas.
- A one-time facility report was due on January 31, 2006.
- The facility reports included facility information, data on TRU activity, and the numbers of TRUs under the facility’s control.
- Fines for delinquent reports are up to $1,000 per day.

- In-use performance standards apply to ALL TRU engines that operate in California. Owners and operators of TRUs are responsible for compliance with the in-use standards.
  - Even the TRUs that are based outside of California must meet these in-use performance standards if they operate in California.
  - That includes the TRUs coming into California from out-of-state, Canada, and Mexico.
- Owners are required to apply for ARB Identification Numbers (IDN) for ALL California-based TRUs.
  - IDNs will be applied to the outside of the TRU like a truck DOT number.
  - IDNs are voluntary for TRUs that are based outside of California.
- Operators are responsible for submitting the Operator Reports, which are required only for those TRUs that are based in California.
- California-based TRUs are TRUs equipped on trucks, trailers, shipping containers, or railcars that a reasonable person would find to be regularly assigned to terminals within California.

Owner/Operator Requirements

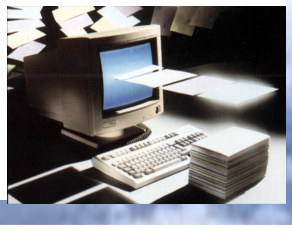
- Here is a picture of an IDN on the side of a TRU housing.
- IDNs will be applied to both sides of the TRU housing.
- The regulation includes lettering specifications. These specifications will be included on the application forms for the IDNs.



- The TRU operator requirements apply to both TRUs and TRU generator sets (or "gensets"), so any reference to TRUs includes TRU gensets, unless otherwise specified.
- The requirements include:
  - In-use performance standards – subsequent slides will provide more information about these standards.
  - ARB ID numbers – applications are due 1-31-09, reporting on TRU owner information, TRU information, TRU engine information, compliance status with the in-use performance standards, and how compliance was achieved for each TRU based in California.
  - ARB will issue a unique IDN for each TRU.
  - The IDNs must be painted or affixed to the TRU housing within 30 days of being issued to the operator by ARB.
  - Operator reports are due 1-31-09, reporting on where the operator's California terminals are located and the TRU IDNs that are assigned to these terminals.
  - Updates are required for both IDN information and operator reports within 30 days of any changes in information.

Forms

- Forms available by early December 2008
  - IDN Application Form
  - Initial Operator Report Form
  - IDN Information Revision Form
  - Operator Report Update Form
  - Download from TRU website and mail into ARB, or
  - Fill out and submit via Internet
    - Link will be added to TRU website
- Workshop/Webcast - late 2008



- Forms will be available by early December 2008. ARB will try to make the forms available sooner, if possible.
- They will be available as hardcopy forms that can be downloaded off the TRU website or you can fill out electronic forms and submit them via the internet. Links will be added to the TRU website for these purposes by early December 2008. Staff will mail forms to those without Internet access, upon request.
- There will be forms for:
  - IDN application,
  - Operator report form,
  - IDN information revision form, and
  - Operator report update form.
- ARB will conduct a webcasted workshop in late 2008 to explain how to fill out these forms.

In-Use Performance Standards

Less than 25 hp TRU/TRU Generator Set Engines

In-Use Performance Standard	Requirement
LETRU	Use 0.30 g/hp-hr engine or Level 2 VDECS retrofit
ULETRU	Level 3 VDECS retrofit or Alternative Technology

Greater than 25 HP TRU/TRU Generator Set Engines

In-Use Performance Standard	Requirement
LETRU	Use 0.22 g/hp-hr engine or Level 2 VDECS retrofit
ULETRU	Use 0.02 g/hp-hr engine, Level 3 VDECS retrofit, or Alternative Technology

LETRU = Low-Emission TRU In-Use Performance Standard
ULETRU = Ultra-Low-Emission TRU In-Use Performance Standard
VDECS = Verified Diesel Emission Control Strategy
Alternative Technology = ULETRU (and LETRU) if diesel PM emissions are eliminated at distribution centers and limited at delivery point facilities.

10

- The important points to take from this slide are:
  - In-use performance standards vary by horsepower,
  - There are two levels of stringency:
    - LETRU
    - ULETRU (more stringent)
  - There are compliance options for meeting the in-use performance standards
- The top table shows the in-use performance standards for less than 25 hp TRU engines.
- The lower table shows the in-use performance standards for 25 to 50 hp TRU engines.
- Alternative Technologies may also be used to meet ULETRU (and LETRU), but to qualify, TRU diesel PM emissions must be eliminated at distribution centers and limited at delivery point facilities. There will be more about this in a later slide.

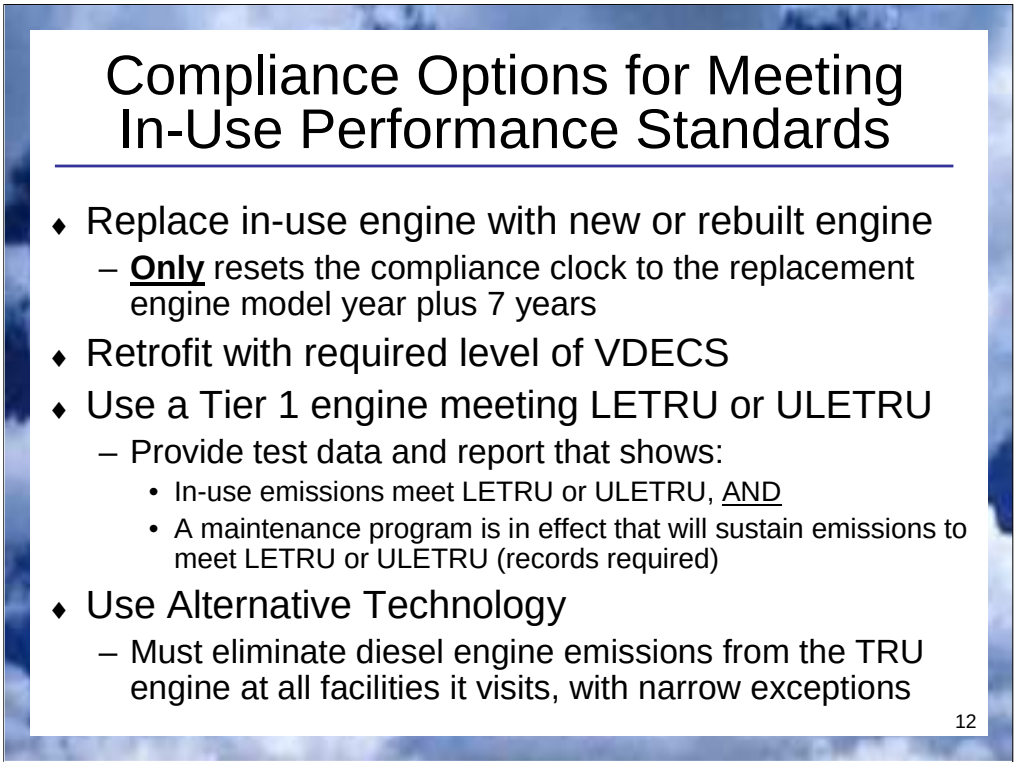
In-Use Performance Standards Compliance Schedule

Engine Model Year	In-Use Compliance Standard Compliance Date	
	LETRU	ULETRU
2001 and older	December 31, 2008	December 31, 2015
2002	December 31, 2009	December 31, 2016
2003	Does Not Apply	December 31, 2010
2004	Does Not Apply	December 31, 2011
2005	Does Not Apply	December 31, 2012
2006	Does Not Apply	December 31, 2013
2007	Does Not Apply	December 31, 2014
2008	Does Not Apply	December 31, 2015
2009	Does Not Apply	December 31, 2016
2010	Does Not Apply	December 31, 2017
2011	Does Not Apply	December 31, 2018
2012	Does Not Apply	December 31, 2019
2013	Does Not Apply	December 31, 2020
2014	Does Not Apply	December 31, 2021

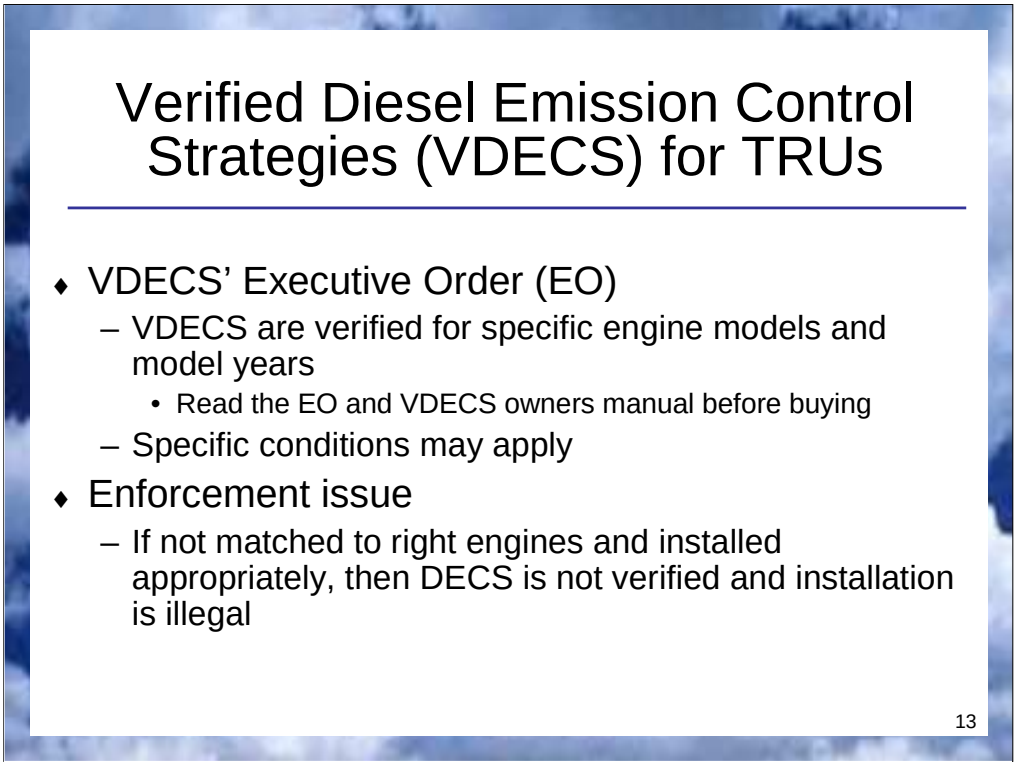
Generally, the compliance date is December 31st of model year plus 7 years.

11

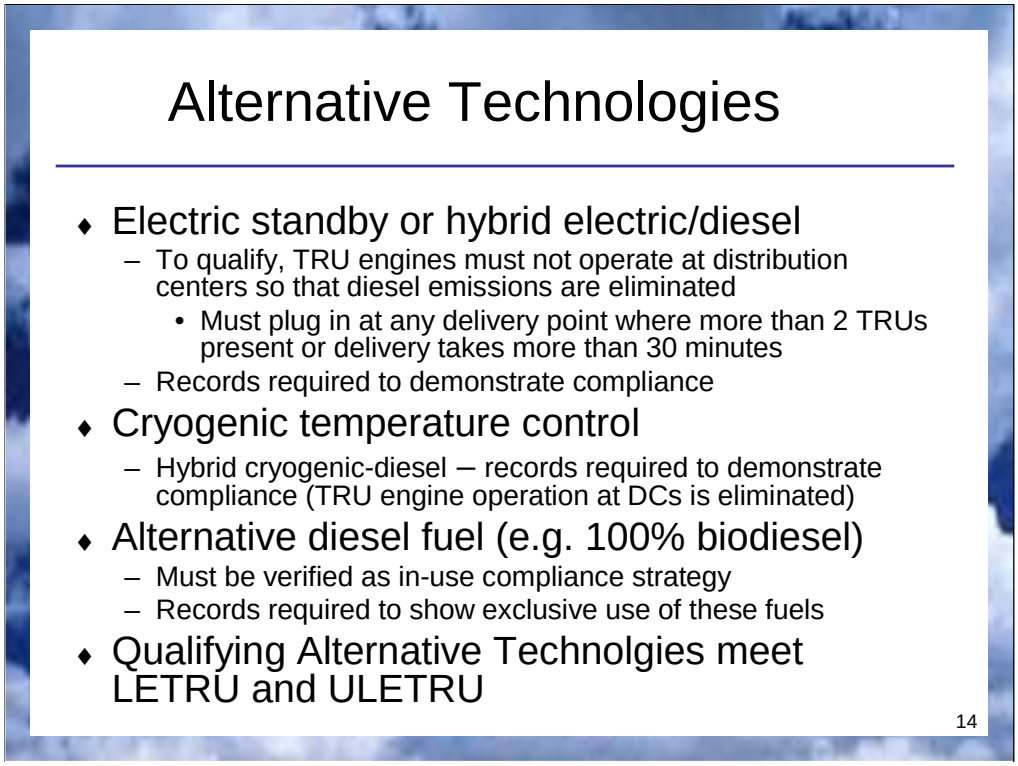
- This table shows that compliance dates are phased in, based on the engine model year.
- Looking at the first row, you can see that model year 2001 and older must comply with LETRU by the end of 2008.
  - Then, these same model years, if they are still in use, must comply with the more stringent ULETRU by the end of 2015, 7 years after meeting LETRU.
- On the second row, you can see that model year 2002 must comply with LETRU by the end of 2009.
  - Then, model year 2002 engines, if they are still in use, must comply with ULETRU by the end of 2016, 7 years after meeting LETRU.
- 2003 and subsequent model years skip LETRU and must comply with ULETRU by the end of the 7th year after the engine model year.
  - So, model year 2003 engines would have to meet ULETRU by December 31, 2010.
  - Model year 2004 engines would have to meet ULETRU by December 31, 2011.
  - And this pattern would continue until the engine is equipped new with a diesel particulate filter that reduces diesel particulate matter by at least 85 percent.
- You can see from this table that all in-use TRU engines must eventually comply with ULETRU in order to operate legally in California.
- The model year is displayed on the engine label. These are typically on the valve cover or oil pan. If there is no engine label, it's usually because it is older than a tier 1 engine. Tier 1 started in 1999 for 25 to 50 hp engines and year 2000 for less than 25 hp engines. The engine serial number can also be be used to determine the model year of the engine. Ask your TRU dealer for help in determining the model year of the engine if you can't find the engine label or serial number.
- Again, the engine model year is used to determine the compliance date for the in-use performance standards. Don't confuse the TRU model year with the engine model year when it comes to determining the compliance date. They can be different. You must go by the engine model year, not the TRU model year.
- So, the first thing you need to do is list all of your TRUs by engine model year. And while you're at it, you may as well list the engine make, engine model, engine serial number, the TRU make, TRU model and TRU serial number, and how many hours are on the TRU engine. ARB believes you'll need all of this and maybe more to develop your compliance plan.



- There are several ways to comply with the in-use performance standards.
- The first is to use a TRU with an engine that is newer than 7 years old, as in replacing an old engine with a new or newer engine. This **only** resets the compliance clock for meeting the in-use performance standards to 7 years after the new engine model year.
- Old engines may be remanufactured to more stringent emissions standards, provided all of the parts used are from a "matched set" of parts from a configuration that has been certified to meet the more stringent emissions standard. A supplemental label must be permanently affixed in a visible area of the engine that includes the year of the rebuild and the emissions standard being met. This **only** resets the compliance clock to 7 years after the effective date of the certified configuration Executive Order, which may not be the same as the rebuild date. Because of this, rebuilt engines may not provide 7 years of compliance from the rebuild date.
- Some fleets are complying by replacing older TRUs with new or newer TRUs.
- Retrofitting with the required level of VDECS is another option.
  - Level 2 VDECS for meeting LETRU and
  - Level 3 VDECS for meeting ULETRU.
- Using an in-use model year 1999 through 2003 Tier 1 engine that meets the LETRU in-use performance standard may be a compliance option, but qualifying for this may be more difficult and expensive than it's worth. ARB has learned that emissions of in-use TRUs are much dirtier than expected because most TRU owners do not complete the emissions-related maintenance unless there is a performance problem. Also, the emissions deterioration factors that were used by the engine manufacturers may not be accurate. That means we cannot rely on the new engine certification values. In-use engine testing would need to be conducted to show that in-use emissions are meeting LETRU. And an emissions-related maintenance program would have to be in place that periodically restores emissions to specification to provide more certainty that the engine meets the in-use performance standard. So far nobody has indicated any interest in this approach. The Executive Officer would approve all of these on a case-by-case basis.
- Using Alternative Technology is another compliance option. The key to using an Alternative Technology is that it must eliminate the use of the TRU engine or the emissions of diesel PM while it is at a distribution facility. There will be more on this in a later slide.



- Proper selection of VDECS requires due diligence by the TRU owner.
- Read the Executive Order that ARB issued when the verification was approved and carefully review the VDECS owners manual before you buy it to be sure the DECS is matched correctly to your TRU engine.
- To be considered "verified," a DECS must be matched with the correct engine model and model year engine, and used under the conditions for which it was verified.
- ARB inspectors will look to be sure the retrofitted devices are truly verified and matched with the correct engine.



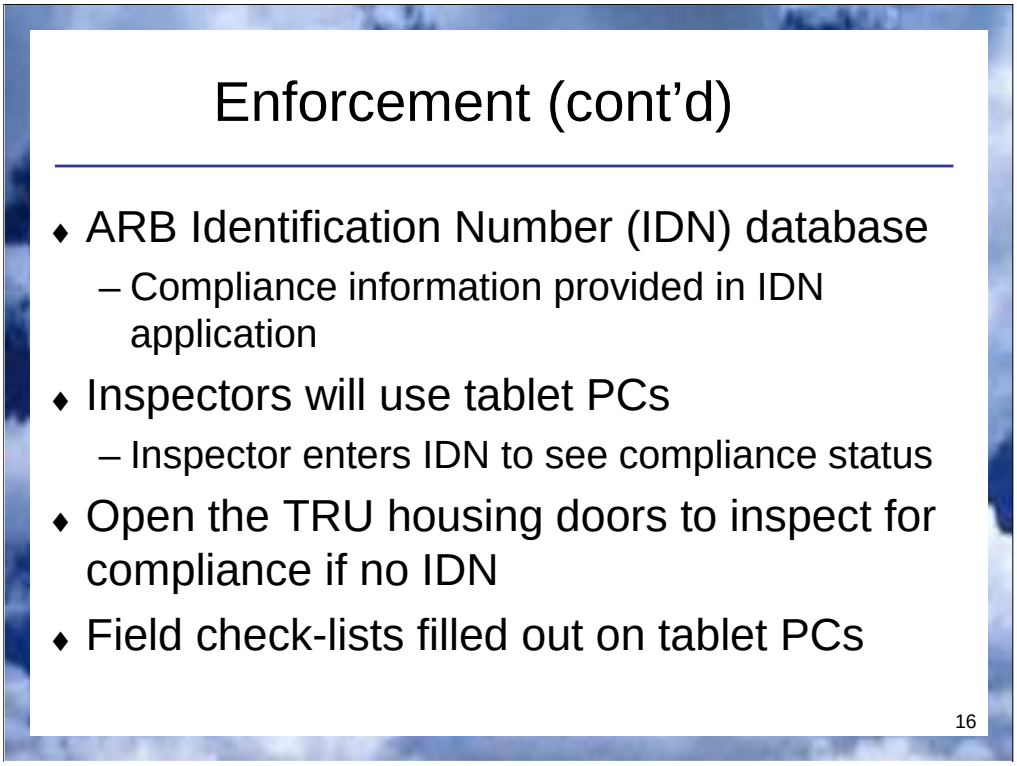
- Alternative technologies must be used in such a way as to eliminate the TRU engine operation while at a distribution center or eliminate diesel particulate matter emissions.
- If you choose electric standby as your compliance option for a TRU, then the TRU engine can't operate at any facility. There are limited exceptions to this:
  - TRU engine operations that are related to normal ingress and egress (e.g. engine operation during normal movements around the yard) at the distribution center are acceptable.
  - TRU engine operations that are related to repair and maintenance
  - TRU engine operation at drop-off points is acceptable, provided there are no more than 2 TRUs there at one time and the stay does not exceed 30 minutes.
  - Recordkeeping is required with the use of electric standby – the onus is on the operator to demonstrate TRU engine use is eliminated at the distribution center.
- Cryogenic refrigeration systems would also require recordkeeping if they are of the hybrid type, where there is a diesel engine that can be used when on the road. Records need to demonstrate diesel TRU engine use is eliminated at distribution centers and delivery points.
- Alternative diesel fuels must be verified as a VDECS, must be used in the "neat" form (100% biodiesel with no conventional diesel), and must be used excusivley (you cannot switch back and forth between B100 and conventional diesel).
  - Recordkeeping is explicitly required by the regulation for the use of alternative diesel fuel, to show exclusive use of these fuels.
- Keep in mind that qualifying Alternative Technologies can be used to meet LETRU and ULETRU.

Enforcement

- ARB implementation and enforcement
  - Inspections at border crossings, scales, roadside, terminals, distribution centers, and delivery points
  - Operator - fines up to $40,000/day (per California Health and Safety Code)

15

- Inspections will take place at border crossings, scales, and roadside inspections, distribution centers, terminals, and delivery points. Essentially, anywhere TRUs operate, inspectors may check for compliance.
- Fines can be up to $40,000 per day per violation or 1 year in jail **or both** (per California Health and Safety Code)
- ARB plans to aggressively enforce this regulation.



- IDN applications include information about how the unit came into compliance (if the compliance date has passed for the unit's model year).
- On-line IDN applications will populate a database with information about how your TRUs were brought into compliance. ARB staff will also input hardcopy application forms that are mailed in.
- Inspectors will use small tablet PCs to enter an IDN and get all the compliance information we have on that unit.
- California-based TRUs are required to have IDNs. Inspectors will look for California -based units with no IDN and a ticket will be issued to the driver for any violations. As mentioned earlier, the TRU owner is responsible for the IDN.
- TRUs that are based out-of-state aren't required to have IDNs. On out-of-state units, inspectors ask the driver to open the TRU housing to check compliance. This will take more time than using an IDN. Fleets that come into California frequently are likely to be interested in getting an IDN to speed up the inspection process. Therefore, out-of-state TRU owners may voluntarily apply for IDNs. There are no fees for IDNs at this time.
- As mentioned earlier, the TRU owner is responsible for compliance with the in-use perfomance standards.
- Inspectors will fill out electronic check-lists on the hand-held computers.

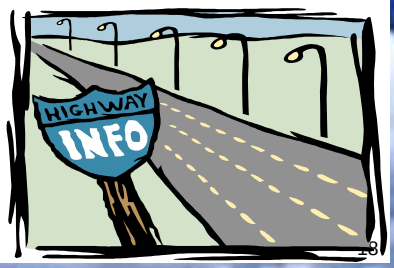
Enforcement (cont'd)

- Comprehensive audits at:
  - Carrier terminals
  - Distribution centers
- Review records, check accuracy
- Inspections resulting from:
  - Complaints
  - Tips from public
  - Leads from staff
- Plan to comply early

- More comprehensive audits will take place at carrier terminals and distribution centers. In addition to checking for compliance with IDNs and in-use performance standards, inspectors will audit operator reports to ensure they are up to date and the information is true and correct. As mentioned earlier, the operator is responsible for the accuracy of the operator report.
- Some inspections at terminals and DCs will be in response to complaints, tips from the public, and leads from office staff.
- The best approach is to plan to comply early. Don't wait until the last minute. There is no provision in this regulation for compliance extensions.

Further Information/Contacts

- TRU website: **http://www.arb.ca.gov/diesel/tru.htm**
- Verification website (Mfr info & Executive Orders):
  http://www.arb.ca.gov/diesel/verdev/vt/vt.htm
- TRU List Serve: **http://www.arb.ca.gov/listserv/tru.htm**
- Rulemaking record (Staff Report):
  http://www.arb.ca.gov/regact/trude03/tru03.htm
- Toll-Free TRU Help Line
  - 1-888-878-2826
    (1-888-TRU-ATCM)



18

- If you need more detailed information, we have a TRU website that provides compliance assistance materials and lists VDECS for TRUs. The web address is shown in this slide. Documents include:
  - TRU ATCM Status Update
  - "How Do I Comply with the TRU ATCM"
  - "Frequently Asked Questions and Guidelines for Compliance"
  - TRU Brochures #1 and #2 (in English and Español)
  - Final Regulation Order
  - Advisories

- The Verification Website is listed here also – this is where you'll find the VDECS Executive Orders.
- Sign up for the TRU Listserve so that you are emailed notices related to TRU ATCM compliance. Go to the website shown. Then leave it at "All Lists", and enter your email address twice. When all of the listserve lists come up, scroll down and check the box next to Transport Refrigeration Units. Then, scroll down to the bottom and click on the "Send Subcribe/Unsubscribe Requests" button.
- If you're interested in the TRU ATCM staff report, it is available at the rulemaking record website shown here.
- If you have further questions, call us at ARB's toll-free TRU help line:
  1-888-878-2826 (1-888-TRU-ATCM.)